

«AR700» - Device for Defect Location in High-Voltage Equipment Insulation by Acoustic Sensors



“AR700” device is used for measuring of acoustic signals on the external surfaces of gas-insulated breakers and substations, power transformers and other tank high-voltage equipment. The acoustic signals are caused by partial discharges in the insulation, which is the sign

of the defects.

The advantage of “AR700” device is the quick installation of the acoustic PD sensors on the external surface of high-voltage equipment tank. The sensors have magnetic holder that is why there is no need to de-energize the equipment for the sensors installation.

“AR700” device has 4 synchronic channels for acoustic signal measurement. This gives the possibility not only to find the defects in the insulation, but also to locate them. The location function of the “AR700” device is unique for acoustic devices.



The Measurement and Diagnostic Methods

To locate a defect inside the equipment, 4 acoustics sensors should be installed on the tank surface in a definite order. The basic diagnostic

factor is measuring the time of arrival of PD pulse to different sensors.

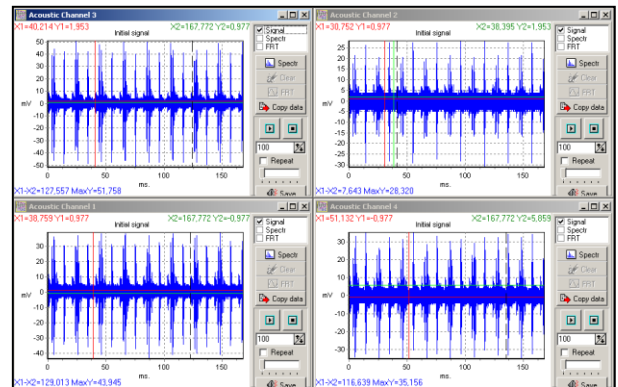
For better noise immunity in “AR 700” device there is one supplementary channel for PD measurement, which operates in the high-frequency range. An electric transformer (for example RFCT sensor) is connected to this channel.

At the first stage of diagnostics, the zone of high acoustic activity is found on the surface of transformer tank. Then all the 4 acoustic sensors should be installed in the defect zone, and thus the defect location is carried out by using special

firmware. The results are displayed in the screen of the device as a graph.

The specific feature of the “AR700” device is the possibility of listening to the measured pulses in the slow mode by headphones which are supplied together with the device. In this mode the user can make the measured signals audible by changing their frequency. The permissible range of slowdown is from 50 up to 1000 times. It allows the user to collect the database of the “acoustics fingerprints” of acoustics signals, using his own ear as the means of expertise.

The “AR700” device allows synchronizing the PD pulse measurements to the supply voltage. For this purpose “PFR-1” radio sensor of reference frequency and phase is used. Due to synchronization, the user can define the type of the insulation defect. Different amplitude, phase and frequency diagrams the HF pulse distribution of are used for this.



The device is made using a modern microprocessor; it has bright color display and considerable memory space. The device is delivered in hermetic plastic case.

Special software is available in the delivery set; the software allows analyzing the pulse distribution and the defect’s “acoustics fingerprints” by the device itself, as well as by the standard the computer audio programs.

The device can be used in the non-hostile environment in the operating temperature range of -20°C to +40°C and relative humidity of <98%, noncondensing.

Specification of “AR700” Device

No	Parameter	Value
1	Channels for PD pulses measurement	4 acoustic and 1 electric
2	Frequency range of acoustic sensors, kHz	30 ÷ 330
3	PC Interface	USB 1.1
4	Operating from build-in battery, hour	8
5	Dimensions, mm	220*168*37
6	Weight of the device, kg	1.1
7	Weight of the delivery set, kg	12